

AC 901
P3
no. 3616
part 2

*Reprinted from THE CANADIAN MEDICAL ASSOCIATION JOURNAL,
August, 1919*

CANADIAN DOCTORS AND UNCANADIAN DISEASES

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NO doctor is properly established in his profession who has not a broad understanding of disease processes other than those usually affecting the inhabitants of the locality where he practises.

Once, and perhaps still in isolated communities, medicine could give a satisfying life and livelihood to men who ignored the existence of unfamiliar disease and, guided by symptomatic therapy, found nothing to prevent them from placing each pathological condition encountered in one of the classifications taught to them by their teachers, text-books and experience. To-day, the situation has changed. To-day, in Canada, no serious student of medicine, graduate or undergraduate, can afford to know nothing of the pathology of diseases affecting men and animals in other parts of the world even though those diseases have never been heard of near his home.

It is so for two reasons. First, because with the development of rapid transportation no doctor can limit the diseases which may come to him, or to which he may be carried; second, and more important, increased knowledge of diseases prevalent in unstudied areas has thrown, and is throwing, light upon many of our daily problems of pathology which have been unperceived, misunderstood or unexplained.

Mechanical transportation by water, land and air, has made the world very small. Students from the ends of the earth gather at a university; a score of men from tropical countries study medicine at McGill. There is no part of the world to which a Canadian doctor may not be called; about three hundred graduates of McGill live in warm climates. Nowadays, there is scarcely a disease which is never seen in a city through which an important travel route passes; cases of malaria, hookworm, sleeping sickness, elephantiasis, and relapsing fever are occasionally treated in Montreal.

Look at a map of the world. One of the basic causes of the war was the land-hunger of the millions close-packed in the European

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peninsula. Belgium has 665 persons to a square mile; Great Britain, 374; Italy, 330; Germany, 325; Austria, 242; France, 191; just before the war Germany was increasing her population at a rate of about one and a half per cent. yearly; the increase in the rest of Europe was less rapid. Where is the land by which these peoples and their progeny, undestroyed by future war, are to live? Westward emigration ceases on our Pacific Coast—Japan has 385 persons to a square mile and China 172. Parts of the northern and southern temperate zones are sparsely populated; the United States has 34 persons to a square mile; South Africa, 15; Argentine 7; Canada, 2; Siberia, 2; Australia, 2. But, already, there are large unsettled and unappropriated areas in Canada, and the United States will soon import, rather than export, foodstuffs.

Look at a map of the world. The tropical belt is usually said to extend between $23^{\circ} 7'$ north and $23^{\circ} 7'$ south of the equator. In all that area, excepting parts of southern Asia, there are few people and little more than outposts of European civilization. Phœnicia, Greece, Rome, Spain, Portugal, Holland, France and Great Britain, during the past three thousand years have successively and repeatedly endeavoured to establish off-shoots of their stock in the tropics. For a time, some of the colonies were prosperous and seemed likely to be permanent; northern Africa is dotted with the ruins of Grecian and Roman cities; in 1650 A.D., Portuguese Loando had 15,000 persons—now it has about 3,000; the success of Spain's empire in the Americas covered more years than does the history of the United States. Many causes, local and European, economic and political, contributed to the failure of these colonies. One cause and the most important, was always present; the tropics were unhealthy for Europeans. The last twenty years have shown that disease, not climate, caused that unhealthiness. In the last twenty years, means of preventing or curing diseases that were formerly irresistible have been discovered. Europeans, with their accustomed domestic animals, can now work and live in areas where their fathers perished. When the French failed at Panama they had buried 20,000 persons. When the Canal was built, the death rate in the canal zone was less than the death rate of New York. To-day, Europeans spend years in Africa without malaria; yellow fever, already a rarity, may soon disappear from Central and South America; in Northern Australia, a virile, all white population is proving that it can work with its hands and thrive in the tropics.

There are many places in the tropics where extreme heat

combines with lack of water, or with great humidity, to produce physical conditions—a climate—that are almost intolerable. Europeans will not readily live in such places. But there are thousands of square miles in tropical Africa and in tropical America where heat is never so oppressive as it often is at midsummer in our own Quebec. These are almost virgin lands; they need and will reward richly European road-builders, administrators, engineers, overseers and husbandmen. Africa is no longer a dark continent; it is the largest remaining field for European colonization and it is near Europe. Berliners thought themselves next door to the Persian Gulf; Basra and Lake Chad are equidistant from Berlin. The distances between Newfoundland and Vancouver, London and Lake Tanganyika, Moscow and Lake Baikal are equal; to us, six days of railroad travel is a commonplace. Aerial communication brings Africa still closer. A Zeppelin was over Khartoum with supplies for German East Africa when the German forces there surrendered; it returned, without landing, to its starting point in Bulgaria; a British aeroplane has flown from London to Delhi; airmen have crossed the Atlantic.

If tropical diseases can be overcome as completely as present successes promise, Africa will be developed infinitely more quickly than North America has been; there is no winter; in certain areas, there are two rainy seasons and two crops can be grown annually; there is a large and usually industrious native population. These factors, alone make it possible to produce many things in tropical countries much more cheaply than they can be grown in the temperate zones. In addition, life in Europe and North America depends upon many products which can be grown only in the tropics; the war taught the blockaded central European powers and ourselves, our dependence upon palm oils, rubber, cotton, tea and coffee. Finally, in long-settled areas, especially in Europe, land is often valued at a figure higher than its productivity warrants; the price of land in sparsely-settled areas is more directly proportionate with the value in the world market of that which the land produces. Consequently, the cheaper lands of the tropics, quite apart from their greater productivity, and sometimes in spite of adverse bounties and transportation costs, are often able to produce essential commodities, such as meat, grain and fruit, at prices which make the competition of northern countries economically impossible. These facts have already taken many investors and workers from Europe and the United States to the tropics, many more will go; doctors must go with them.

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Generations of tradition and of economic association urge and draw British youth to the ends of the earth. Already, the men of Britain, leaving "their scarce-cooled guns", are at work in Palestine and Mesopotamia; fruit-farmers from the Okanagan are planting orange groves in the Holy Land, while a joint stock company is irrigating the Garden of Eden! Lacking the British traditions and associations, Germany found an active movement of public instruction in the wealth of tropical dependencies a necessary part of the colonial policy which she commenced after the fall of Bismarck. In every large German town there is a tropical museum and on every book-stall there are beautifully-printed handbooks of travel and commerce in the, once, German colonies. One book indicated how a German might gain wealth in the tropics by asserting that no negro should be permitted the prosperity which enables a native trader in British Lagos to employ a white chauffeur!

Germany realized, and realizes that, under modern conditions, her industrial population of 70,000,000 people can not remain at home without a field abroad from which food and raw materials may be cheaply obtained; at the Peace Conference she seeks to be free to send settlers to, and to obtain supplies from, her former colonies as freely as other nations will do. British, French and Belgian experience, as well as that of the Germans, has shown that with modern methods white men, women and children can live actively and healthily in tropical Africa. Within the next few years, many thousands of Europeans will go to Africa to build railroads, to establish inland steamship lines, to manage plantations and ranches, or to take advantage of the many opportunities for external and internal trade. Doctors will go with them.

To Europe, Africa is a foreland, just as is tropical America to our continent. Canada and the United States already have large interests in Mexico and in Central and South America. These interests will increase and, as they grow, doctors will be needed there also.

Look at a map of the world. Halifax and Glasgow are practically equidistant from Sierra Leone; Halifax and New Orleans are practically at equal distances from British Guiana. And, just as Nova Scotia, projecting into the North Atlantic, approaches Canada to West Africa and to British territory in the West Indies, so is British Columbia Canada's gateway to the Pacific, Australia and the far East; Yokohama is sixteen days from San Francisco and but thirteen from Vancouver. During the year ending with March, 1917, the goods exchanged between Canada and countries

where tropical diseases are endemic had a value of about \$80,000,000. During the war, Canada's manufactured exports increased enormously. Munitions are no longer required; but, Canada has industries such as milling, fishing, lumbering, mining and the manufacture of agricultural implements in which she should produce as cheaply as any part of the world. The output of these industries will increase, not diminish. From our convenient seabords, more Canadians than ever before will accompany the exchange between Canadian goods and things which our colder country does not produce.

Canadians come of a colonizing stock; their young men wish to go farther; through the war, to do largely has become a necessity for many of them. All of these things combined invite Canadian doctors to the tropics. National interest requires that some shall go. The personal interest of those who do go will not suffer, for they will be well paid in things—money, consideration, understanding—that men desire. Those of our young men who go to these, the latest of the promised lands, will do well. They are fitted for the venture, and Canada's name in the war has everywhere earned for Canadians a new and a wider respect.

The factors which will take increasing numbers of men from temperate to warmer climates will have a reverse effect; more men than before will go from the tropics to colder countries. These will bring their ills with them and Canadian doctors, even those practising in country districts, may easily meet patients with outlandish ailments. Recently, in Colorado, everyone of a picnic party developed relapsing fever; it was found that the disease had been caught, with lice, from a group of wandering Bulgarian gypsies. Allusion has already been made to the occasional cases of exotic disease which are never absent from every northern centre of population—Liverpool and London maintain special hospitals to care for them. These diseases may become, for a time at least, endemic; for years, now, plague has been constantly present along the Pacific Coast of the United States; as a result of the war, there have been in England many cases of malaria, and in France, of spirochaetal bronchitis, among persons who had never left their home-land.

It should not be forgotten that diseases are often called "tropical" because they are now most usually seen in warm countries. We, who live in the northern temperate zone, should not forget these facts; malaria has killed its thousands about Oxford and Chicago, in Southern Ontario and in Flanders; hookworm is as fatal to miners

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in Cornwall and Northern America as it is to the poor whites of the Southern States. "Tropical diseases" exist wherever the required conditions are present; if these conditions are altered, the diseases disappear from "unhealthy" tropical countries just as they have disappeared from our own "healthy" temperate climate.

Every Canadian student of medicine should know enough of tropical diseases to deal intelligently with them, should he be called upon to do so either at home or abroad. That is a sufficient reason, but there is a second and a weightier one, for providing instruction in tropical diseases at every medical school. An acquaintance with tropical medicine is essential to a proper understanding of disease, its recognition, prevention and cure.

Twenty-five years ago, comparatively little was known of tropical diseases. Since then, much work has been done. Schools of tropical medicine exist in many of the world's universities. Investigators have been sent to the tropics from every active nation. The records of their work and observations from medical men, hospitals and research laboratories in the tropics form an enormous literature, printed in an extraordinary number of languages; there is no division of medicine which supports so many special periodicals, reviews and quarterlies. The field is a rich one. Researches made in it have been exceedingly fruitful. The discoveries made have been valuable in combatting tropical diseases, and they have thrown light upon unknown things in diseases of temperate climates and, more important, they have widened our understanding of health and disease.

In the tropics a physician can never lose sight of man's relative position in nature. One who studies tropical diseases is not permitted to forget that man is an animal who, in conflict with other living beings, visible and invisible, is continuously striving to maintain himself. He is not permitted to forget that nothing in nature is fixed; that classifications are only convenient aids to memory—for living things will not remain within the limits of a description which once was accurately theirs; that man's immunity against pathogenic organisms is maintained by a constant struggle with those organisms; that these organisms constantly change their character so that the immunity, potent against one strain of an organism, may not protect against another strain although it comes from an identical parent stock.

In the tropics, one is not permitted to forget that since man is an animal, he often suffers from the same diseases as do other animals about him. In Canada, one sometimes forgets that dogs

have hydrophobia, horses lock-jaw, and we remember that human is different from bovine tuberculosis. The discovery that Texan cattle-fever was transmitted by an intermediate carrier, a tick, gave the cue to similar processes in many human diseases; mosquitoes transmit malaria, filariasis and dengue; lice carry relapsing fever, typhus and trench fever. A study of the malaria of birds explained the life history of the parasites of human malaria. Attempts to cure the trypanosomiases of animals showed the way to our modern treatment of syphilis.

As a rule, a practitioner in the tropics knows more of the cause, process, prevention and cure of the diseases with which he deals than does his confrère who works in a Canadian hospital. The directness of the indications for specific action, and the inevitable promptness with which the proper action is followed by the expected result, make those who are accustomed to deal with tropical diseases impatient of unexplaining empiricism and determined in refusing to be blind to unsatisfactory practice even though it be established by custom.

The destruction of mosquitoes, and the consequent prevention of mosquito-borne diseases, such as yellow fever and malaria; treatment by arseno-benzol which destroys the spirochaetes of relapsing fever, syphilis and other diseases of similar causation; the exhibition of ipecac and the alleviation of amœbic dysentery; these are all instances of efficient, direct and specific action that are not easily paralleled in the everyday control of those diseases which are not usually known as tropical. Practice in a field where right methods achieve specific success makes a demonstrated diagnosis necessitous and always sought. The microscope is the basis of a doctor's work in the tropics; he sees the cause of his patient's disease before he attempts to cure it. For him, the days of "therapeutic tests" and "clinical syndromes" are fast passing; he is accustomed to direct methods.

During the war, a knowledge of tropical diseases helped to a recognition of the part played by lice in the transmission of trench fever and to a search for the animal host—the—"reservoir"—of the spirochaetes causing Weil's disease and seven-day fever; the spirochaetes causing these diseases are found in the kidneys and urine of, respectively, rats and mice. In western North America and elsewhere, ticks sometimes cause fatal paralysis in children; had the transmission of disease by "insects" been a familiar idea to those who practised in these places, the nature of the disease would not have remained so long unrecognized.

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Most of the known causes of disease in temperate climates are bacteria. Some of the diseases of tropical countries are also caused by bacteria; but the best known of them are due to protozoan parasites. Some of them are associated with organisms of uncertain position and of a few the cause is still unknown. The protozoan parasites are much larger than bacteria, and are often actively motile. For this reason, they can be seen with the microscope much more easily than can bacteria. Their visibility is doubtless one of the reasons which have caused so much work to be done in tropical diseases and which has contributed to the success of that work; it was one reason which led Ehrlich to use trypanosomes for the researches which gave "606". Many problems of tropical disease remain to be solved; many schools of tropical medicine and many laboratories in the tropics offer facilities for their solution. No other field of study offers more entertainment and greater probability of satisfaction to post-graduates who wish to do research work. And, nearer home, there are things to be done by methods which have taught much to those who study the diseases of hot countries; almost nothing is known of the protozoan parasites of Canadian fauna—and flora; nor do we know how ticks paralyze children and lambs in British Columbia.

It is repeated, every Canadian student of medicine should know something of the diseases that do not usually occur in Canada; he should know something of them because he may be called upon to deal with them and, more important, because a knowledge of them is necessary for an alert and comprehensive understanding of human pathology.

